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Title: FRICTION CLUTCH

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Inventor(s): BRAUN HELMUT (DE)

Applicant(s): LUK LAMELLEN _KUPPLUNGSBAU (DE)

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ABSTRACT:

A friction clutch wherein the diaphragm spring has two sets of inwardly extending prongs which are axially spread apart by the marginal portion of an axially movable release plate serving to disengage the clutch by pivoting the diaphragm spring relative to a plate-like carrier on the crankshaft of the engine in a motor vehicle to thereby relax the bias upon a pressure plate which normally presses a clutch disc against a counterpressure plate connected to the carrier. The coupling between the marginal portion of the release plate and one set of the prongs is a bayonet lock type connection which can be disengaged by turning the release plate relative to the diaphragm spring against the opposition of male and female detent members to thereby move each prong of the one set into register with a discrete opening in the marginal portion of the release plate. The release plate stresses the two sets of prongs and is clamped between them when it is turned in a direction to move the prongs of the one set out of register with the corresponding openings. At such time, the prongs of the one set move along sloping ramps which guide them into engagement with convex abutments at one side of the release plate. The other side of the release plate has convex abutments for the prongs of the other set.

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(71) Applicant
Luk Lamellen Und Kupplungsbau GmbH (FR Germany),
Postfach 1360, 7880 Buhl, Federal Republic of Germany

(72) Inventor
Helmut Braun

(74) Agent and/or Address for Service
Reddie & Grose,
16 Theobalds Road, London WC1X 8PL

(54) Friction clutch

(57) A friction clutch, in particular for motor vehicles, has a diaphragm spring (4) with radially inwardly extending tongue portions (5, 6). A pressure disc member (1) which serves for disengagement of the clutch is secured by way of a bayonet-like connection in the radially inward region of the tongue portions and is gripped in the axial direction between a larger number of actuating tongue portions (5) on one side and a relatively small number of holding tongue portions (6) disposed on the other side.

To assemble the pressure disc member (1) with the diaphragm spring (4), the holding tongue portions (6) are passed through radial cutouts provided at the outside periphery of the pressure disc member and the actuating tongue portions and the holding t ngue portions are axially spread by rotary movement of the pessure disc member relative to the diaphragm spring, so that the pressure disc member is clamped betw en said tongue portions. The contact areas for the actuating and holding tongue portions on the pressure disc member are of a spherical configuration. Dimpl s on the disc member engage between actuating tongue portions to centre the member and retain it in the assembled position

Fig.2

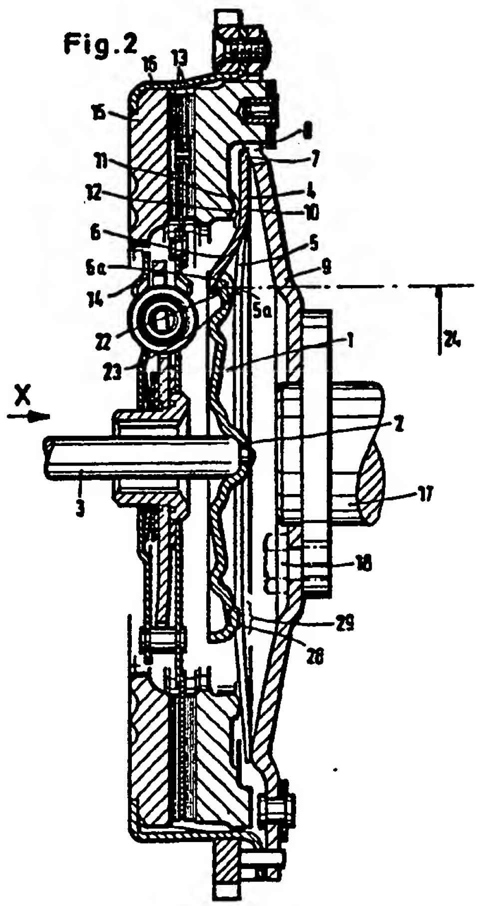

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Fig.1

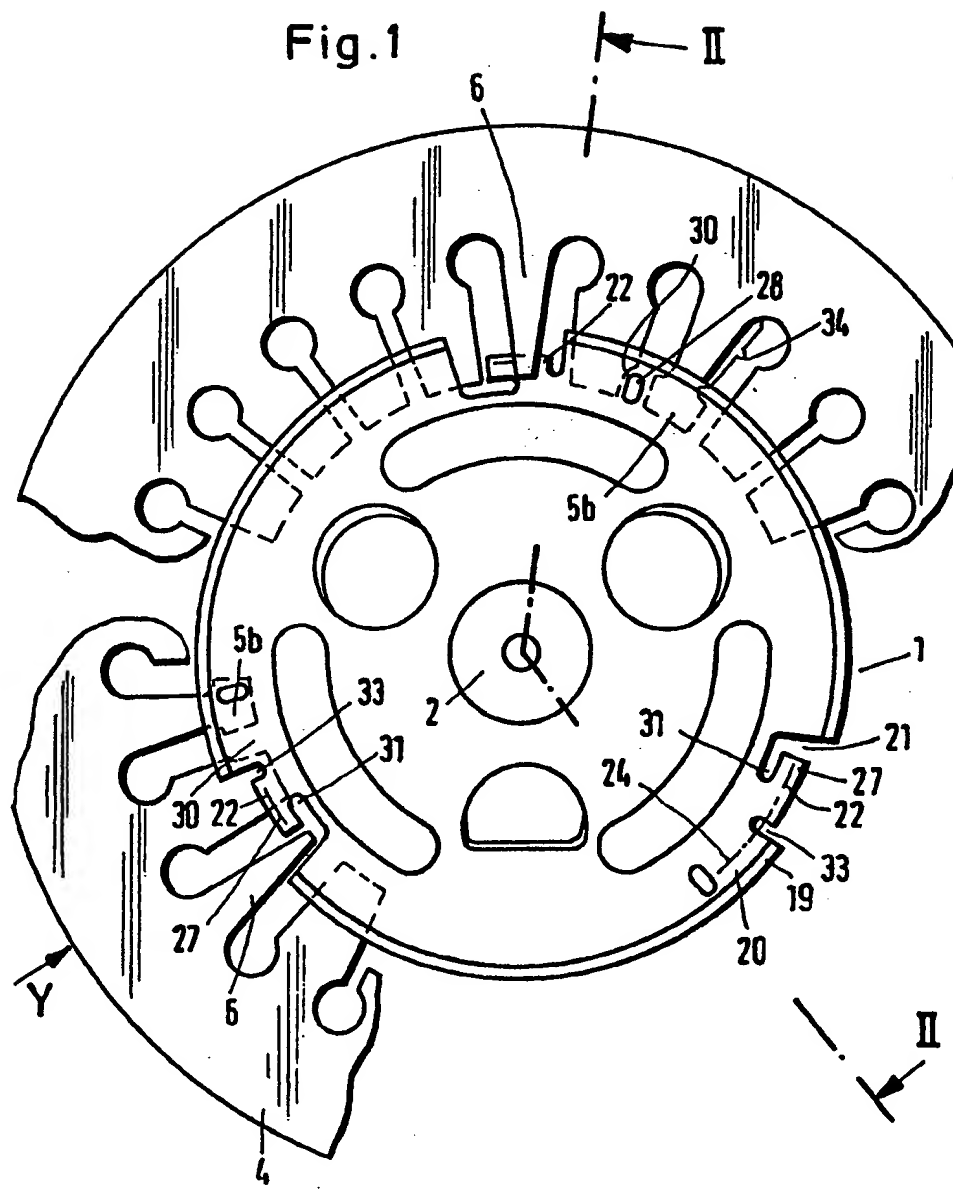


Fig. 2

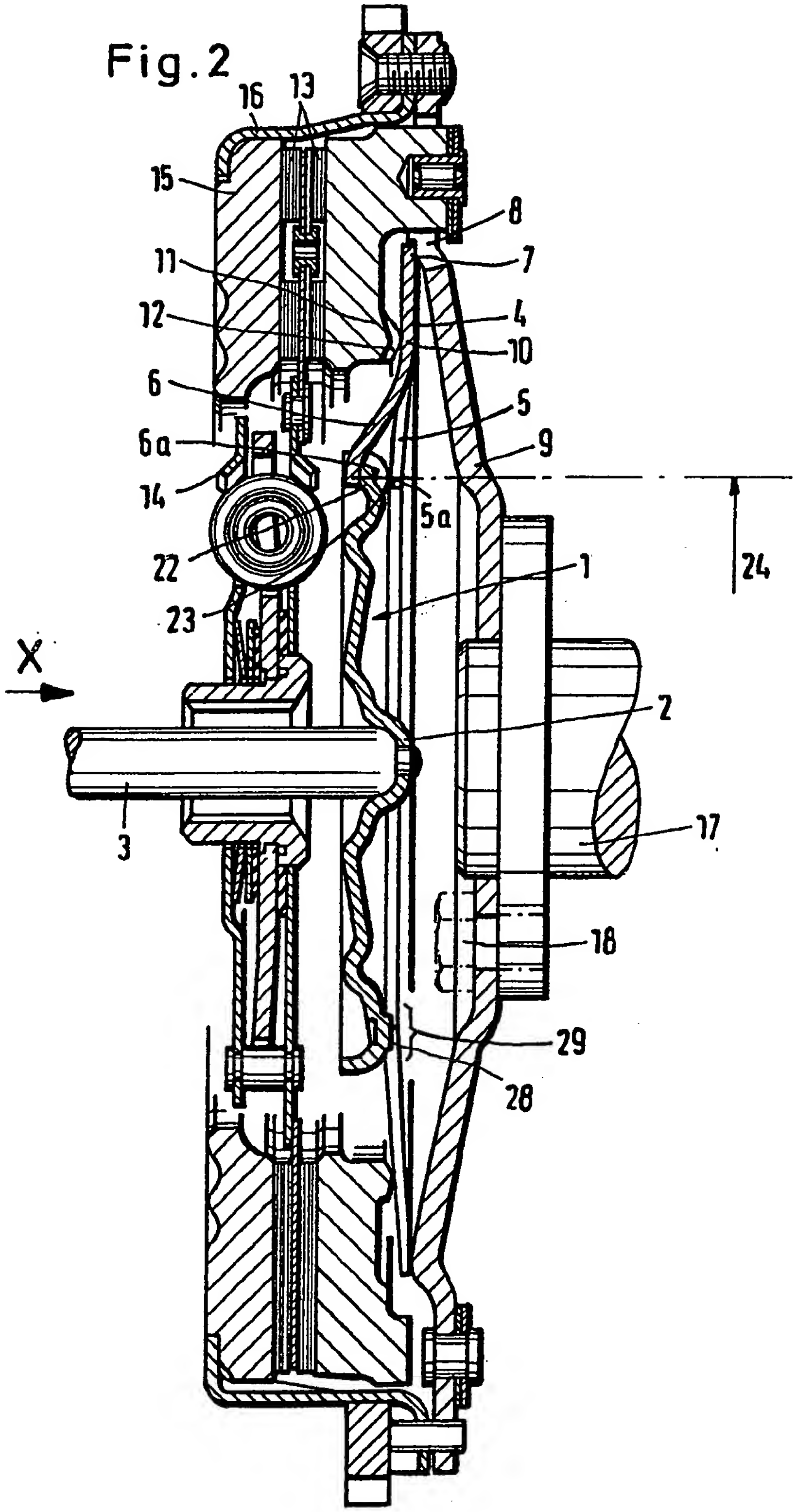
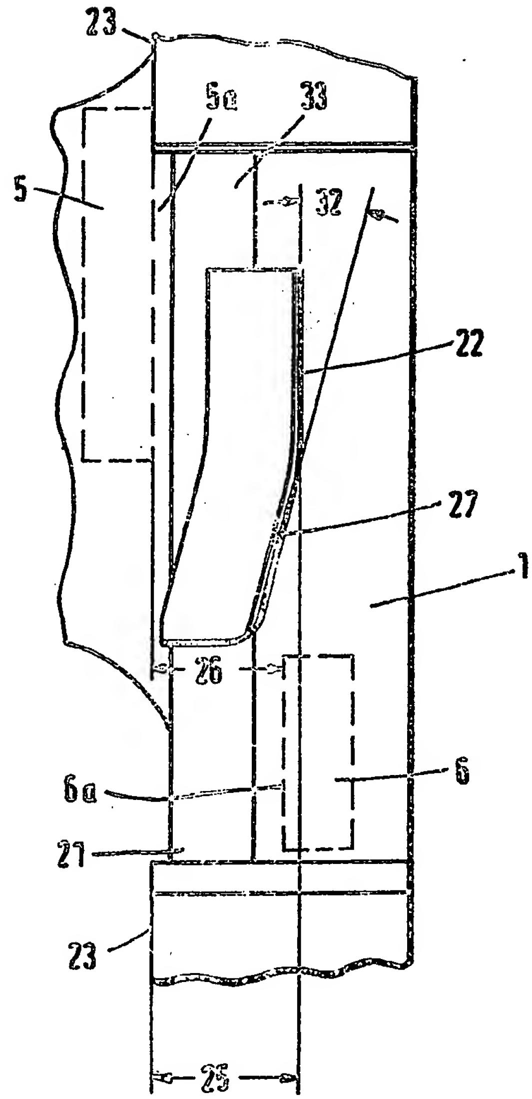


Fig.3



SPECIFICATION

Fricti n clutch

The invention relates to a friction clutch, in particular for motor vehicles, comprising a diaphragm spring which on the one hand is tiltably supported on a component such as a casing and which on the other hand engages a pressure plate and which also has at least substantially radially inwardly extending tongue portions, wherein a pressure disc member which serves for disengagement of the clutch can be secured by way of a bayonet-like connection in the radially inward region of the tongue portions and in that arrangement the pressure disc member is gripped in the axial direction between a larger number of actuating tongue portions provided on the side of the pressure disc member that is in the direction of disengagement of the friction clutch and a relatively small number of holding tongue portions which are disposed on the side remote from the direction of disengagement of the friction clutch and which are bent out in the axial direction with respect to the level in which the actuating tongue portions extend.

Bayonet-like connections between the tongue portions of a clutch diaphragm spring and a pressure disc member which serves for disengagement of the clutch have been proposed for example in German laid-open application (DE-OS) No 2 114 661. In that arrangement, secured on the side of the plate member which is towards the diaphragm spring are plate spring arms which bear resiliently against individual tongue portions on the side of the diaphragm spring which is remote from the pressure disc member. For that purpose, the spring arms are firstly introduced into cutouts which are provided between the individual tongue portions and which are of corresponding configuration, and resiliently deformed by means of an assembly tool in the axial direction, beyond the thickness of the diaphragm spring tongue portions so that, by a subsequent relative rotary movement as between the pressure disc member and the diaphragm spring, the spring arms come to bear, on the side of the diaphragm spring remote from the pressure disc member, against individual tongue portions and, by virtue of their resilient bias in the axial direction, axially fix the pressure disc member to the diaphragm spring tongue portions. However, such bayonet-like connecting arrangem nts are relatively costly and expensive because of the large number of additional comp nents required, such as in particular the spring arms and the fixing means thereof, as w ll as the assembly op ration that they involve.

British patent specification N 1 221 761 discloses another bayonet-type connection wh rein, for th purp s s of holding a disengagement ring provided with a cylindrical projection, individual tongue portions of the diaphragm spring are pressed axially into recesses which are provided in the cylindrical projection, relative to the tongue portions which serve for clutch actuation and which bear against a bead provided at the end of the axial projection, and, by virtue of a rotary movement of the disengagement ring relative to the diaphragm spring come to bear, in a resiliently biased condition, in enlarged portions which extend in the peripheral direction from the axial recesses. However, disengagement rings of that kind require a relatively large axial installation length, which is a factor of particular disadvantage in regard to the presentday conditions of installation to be found in the modern automobile industry. In addition, a special tool is required for mounting the ring on the diaphragm spring in order to press out in the axial direction the tonge portions which are intended for holding the disengagement ring, relative to the level in which the tongue portions provided for clutch actuation extend, so that the tongue portions can be introduced into the enlarged portions which extend in the peripheral direction from the axial recesses.

The present invention was based on the problem of overcoming the disadvantages of the known bayonet-like connections between the pressure disc member and the diaphragm spring tongue portions, and to provide a friction clutch wherein the pressure disc member is mounted to the diaphragm spring in particularly simple, rational and economical manner, while at the same time improving the mode of operation of the friction clutch.

According to the present invention, in friction clutches of the kind set forth in the opening part of this specification, that is achieved in that at its outside periphery the pressure disc member has radial cutouts through which the holding tongue portions can be passed and bearing regions which are formed thereon, for the holding and disengagement tongue portions and which are provided at least approximately on the same diameter and which are of a spherical configuration in opposite directions, wherein the axial spacing between the respective contact locations for the actuating and holding tongue portions on the spherical bearing regions is greater than the axial displacement between the contact regions of the actuating tongue p rtions and the holding tongue portions, which com to bear against the bearing regions, in the non-assembled condition of the pressure disc member.

A configuration of that kind makes it possibl to achi ve a particularly flat or shallow design, as well as providing for easy fitting of the pressure disc member to the friction clutch. Furthermore, the relative movement or

rolling motion which occurs when th friction clutch is actuated, between the bearing regions of the pr ssure disc member and the contact regions of th tongue portions, which bear thereagainst, is reduced to a minimum by the provision of the bearing regions both for the holding tongue portions and for the disengagement tongue portions, on at least approximately the same diameter, and the spherical configuration thereof, so that a substantially lower rate of wear also occurs in those regions. Assembly of the pressure disc member is also particularly simplified as, after the holding tongue portions have been passed through the radial cutouts in the pressure disc member, the pressure disc member only needs to be rotated relative to the diaphragm spring until the holding tongue portions come to bear with their contact regions against the corresponding bearing regions so that the pressure disc member is resiliently gripped between the actuating and holding tongue portions which are urged axially away from each other by virtue of the larger axial spacing between the respective contact locations and bearing regions for the actuating and holding tongue portions on the pressure disc member, relative to the axial spacing between the contact regions on the holding and actuating tongue portions.

To facilitate fitting the pressure disc member to the diaphragm spring, it may be desirable if, as considered in the circumferential direction, between the bearing regions for the holding tongue portions and the radial cutouts, the pressure disc member has a respective run-on ramp for the holding tongue portions, which is also of a spherical configuration and in the same direction as the bearing regions for the holding tongue portions. A ramp of that kind permits the holding tongue portions to be particularly easily spread or axially moved away in relation to the actuating tongue portions during the rotary movement of the pressure disc member relative to the diaphragm spring. The force required for rotating the pressure disc member relative to the diaphragm spring can be influenced in that arrangement by the inclination of the ramp. It has been found desirable for the ramp to extend at an angle of between 10 and 35°, preferably an angle of at least approximately 15°, relative to a plane which extends normal to the axis of rotation of the clutch.

Particular economy in manufacture and an advantageous design configuration can be achieved if the pressure disc m mber is a shaped sh et metal component and the bearing regions for the actuating and holding tongue portions are formed by spherical stamped portions which are formed thereon and which face in opposite directions.

For the purposes f pr viding a non-rotatable connection and for centering purposes, it may also be desirable for th pressure disc member to hav axial projections with which, aft r rotary movement relative to the diaphragm spring, it engages into slots b twe n the actuating tongue portions. In a particularly simple fashion, such projections may be formed by stud-like or pimple-like stamped portions formed thereon, while it may also be desirable for the axial projections to extend radially over the diametral region of the bearing regions for the actuating and holding tongue portions.

In accordance with another feature of the invention, it may be appropriate to provide an equal number of stamped portions forming axial projections, and bearing regions for the holding tongue portions, while it may be advantageous for the pressure disc member to have three stamped portions thereon and three bearing regions for the holding tongue portions, which are respectively uniformly distributed over the periphery of the assembly.

For the purposes of producing the pressure disc member in the form of a sheet metal component, it may be particularly advantageous for the radial cutouts for the holding tongue portions each to be connected to a cut-free portion which extends in the circumferential direction and which at least partially undercuts the run-on ramp, so that the ramp is separated from the other regions of the pressure disc member and can therefore be more easily deformed or bent relative to those other regions, in accordance with the run-on angle. It is possible further to improve the manufacture or shaping of the pressure disc member if, as considered in the circumferential direction, provided on the side of the bearing regions for the holding tongue portions, that is remote from the respective run-on ramp, is a notch which extends radially over the diametral region of the bearing regions for the actuating and holding tongue portions.

It is particularly desirable for the radial cutouts, the cut-free portions and the notches to be so arranged and dimensioned that the respective ramps with the bearing regions associated therewith, for the holding tongue portions, form L-shaped or flag-like regions.

A particularly advantageous embodiment of the pressure disc member may be provided if, as considered in the peripheral direction, the respective angle between the axial projections and the radial cutouts of the pressure disc member is such that, when the holding tongue porti ns of the diaphragm spring are passed through the cutouts in the pressure disc member, the axial projections com to lie on actuating t ngue portions, and in addition the angular spacing betwe n the bearing regions for th holding tongue portions and the projections is such that, after th rotary movement of the diaphragm spring relative to the pressure disc member, which is performed for

making the bayonet-like connection, the holding tongue portions come to lie on the bearing regions thereof, and the axial projections project into slots between the actuating tongue portions, thereby providing a non-rotatable connection between the pressure disc member and the diaphragm spring.

The configuration of the pressure disc member according to the invention provides, in particularly simple manner, that, during the relative rotary motion, the actuating tongue portions that co-operate with the axial projections and the holding tongue portions which run on to the run-on ramps are resiliently deflected in opposite axial directions and, after the relative rotary motion, spring back together again by the axial projections snapping into slots in the diaphragm spring so that the pressure disc member is axially gripped between the actuating portions and the holding tongue portions. In order to reduce the force required for rotating the pressure disc member relative to the diaphragm spring, it may be desirable for the holding tongue portions which run on to the ramps to be more resilient in an axial direction than the other tongue portions. For the same reason, it may also be advantageous for the tongue portions which co-operate with the axial projections to be more resilient in the axial direction that the other tongue portions which lie on the same side of the pressure disc member. In a particularly simple fashion, the increase in axial resiliency of the holding tongue portions may be achieved in that, as considered in the peripheral direction, those tongue portions, at least over parts of their radial extent between their bearing region on the pressure disc member and their radial outward end, are narrower than the other tongue portions. However, the increase in axial resiliency of the holding tongue portions may also be achieved in a particularly simple manner by the holding tongue portions being thinner than the actuating tongue portions.

Pressure disc members in accordance with the present invention may be used in a particularly advantageous fashion in friction clutches wherein a pressure disc member can be secured to the radially inward regions of a diaphragm spring which bears with radially outward regions against a clutch carrier plate which can be secured to the crankshaft of an internal combustion engine and which at a radially further inward position urges an axially movable pressure plate towards a clutch disc which is to be provided between the pressure plate and a counterpressure plate which can be axially and non-rotatably secured to the clutch carrier plate.

The invention will now be described in greater detail with reference to Figs. 1 to 3 in which:

Figure 1 shows a pressure disc member according to the invention, vi wing in the direction indicated by the arrow X in Fig. 2, wherein in the upper half of Fig. 1, the diaphragm spring is shown in the position of being locked to the pressure disc member while in the bottom left quadrant it is shown in the position required for inserting the holding tongue portions into the radial cutouts,

Figure 2 shows a view in section of a friction clutch with the pressure disc member of Fig. 1, fitted on to the diaphragm spring, the pressure disc member being shown in cross-section taken along line II–II in Fig. 1, and

Figure 3 shows a view on an enlarged scale of the pressure disc member, viewing in the direction of the arrow Y in Fig. 1.

In its middle region, the pressure disc member 1 shown in Figs. 1 to 3 has an engagement region 2 which is stamped in a cup-like configuration therein, for engagment by an actuating rod 3 which is axially movable for actuating the friction clutch shown in Fig. 2. The pressure disc member 1 is secured to the diaphragm spring 4 by being gripped between a larger number of actuating tongue portions 5 which are provided on the side of the pressure disc member 1 that is in the direction of disengagement X of the friction clutch, and three holding tongue portions 6 which are provided on the side remote from the disengagement direction X and which are bent out in the axial direction relative to the level in which the actuating tongue portions extend, as can be seen in particular from the upper half of Fig. 1 and Fig. 2.

As can be seen in particular from Fig. 2, the diaphragm spring 4 bears with radially outward regions 7 against support regions 8 of a clutch carrier plate 9 and, by way of radially further inwardly disposed regions 10, engages the pressure plate 11 by way of bearing projections 12. The diaphragm spring 4 is installed in a prestressed condition and urges the friction linings 13 of the clutch disc 14 towards the counterpressure plate 15 which is axially and non-rotatably connected to the clutch carrier plate 9 by way of a spacer or space-bridging means 16, The clutch carrier plate 9 is secured to the crankshaft 17 of an internal combustion engine (not shown) by way of screws 18.

As can be seen in particular from Figs. 1 and 3, at its outside periphery 19 or in its radially outward regions 20, the pressure disc member 1 has radial cutouts 21 through which the holding tongue portions 6 can be axially passed, in order to secure the pressure disc member 1 to the diaphragm spring 4. Also formed on the outer periphery 19 or in the radially outward regions 20 of the pressure disc member 1 are bearing regions 22 for the holding tongue portions 6 and bearing regions 23 for the actuating tongue portions 5, which are provided at l ast approximately on the same diameter 24. In order to minim-

ise the relative movement or r lling m tion which occurs upon actuati n of th friction clutch between the bearing regions 22 and 23 of th pr ssure disc m mb r and th contact regions 5a and 6a of the tongue portions 5 and 6 which are in contact therewith, and thus also to reduce the wear in those regions, the bearing regions 22 and 23 are of a spherical configuration in opposite directions, as considered in the axial direction.

So that the pressure disc member 1 is satisfactorily held to the diaphragm spring after the assembly operation, the axial spacing 25 between the respective contact locations for the actuating and holding tongue portions 5 and 6 respectively, on the spherical bearing regions 22 and 23, is greater than the axial displacement 26 between the contact regions 5a and 6a of the actuating and holding tongue portions 5 and 6, which come to bear against the spherical bearing regions 22 and 23, when the pressure disc member is in the non-fitted condition. That can be seen in particular from Fig. 3 wherein the position of a holding tongue portion 6 when the pressure disc member is in the non-fitted condition is indicated in broken line. Satisfactory mounting of the pressure disc member is achieved if the difference between the axial spacing 25 and the axial displacement 26 is of the order of magnitude of between 0.1 and 1 mm.

In order to facilitate assembly, the pressure disc member 1 has circumferentially extending run-on ramps 27 which are disposed between the bearing regions 22 for the holding tongue portions 6 and the radial cutouts 21 and which, like the bearing regions 22 for the holding tongue portions 6, are of a spherical configuration. The ramps 27 make it easier for the holding tongue portions 6 to be spread or urged axially apart, relative to the actuating tongue portions 5, as is required for mounting the pressure disc member 1 to the diaphragm spring 4.

In order to ensure that, after having been fitted into place, the pressure disc member cannot rotate relative to the diaphragm spring, for example due to vibration, and in order to ensure centering of the pressure disc member relative to the diaphragm spring, formed on the pressure disc member 1 are axial projections which, when the pressure disc member 1 is in the form of a sheet metal component, are formed by stamped-out portions 28 of stud-like or pimple-like nature. The portions 28 extend radially over the diametral region 29 of the bearing regions 22 and 23 for the actuating and holding tongue portions 5 and 6. After th pressure disc member has been fitted on to the diaphragm spring 4, the stude-like or pimple-like portions 28 engage into slots 30 which ar disposed between two adjac nt diaphragm spring tongue portions. In the embodim nt illustrated, there are three stud-lik or pimple-like portions 28 and three b aring regions 22 for respective h lding tongue portions 6, being uniformly distributed over the periphery of the arrangement.

In ord r to facilitat manufacture of the pressure disc member in the form of a sheet metal component, the radial cutouts 21 are each connected to a cut-free portion or slot 31 which extends in the circumferential direction and which undercuts the corresponding ramp 27 in the circumferential direction. By virtue of that configuration, the ramps 27 are separated from the remaining areas of the pressure disc member 1 and can therefore also be easily deformed or bent over relative to the above-mentioned remaining areas of the pressure disc member 1, in accordance with the angle of inclination of the ramp surface, as indicated at 32. A further improvement in manufacture or shaping of the pressure disc member is provided by the notches 33 which, as considered in the circumferential direction, are disposed on the side of the bearing regions 22 that is remote from the respective ramp 27, and which also extend radially over the diametral region 29 of the bearing regions 22 and 23 for the actuating and holding tongue portions 5 and 6.

In the embodiment illustrated, the radial cutouts 21, the slots 31 and the radial notches 33 are so arranged and dimensioned that the respective ramps 27 with the bearing regions 22 associated therewith form L-shaped or flag-like areas, as can be seen in particular from Fig. 1.

As Fig. 1 also shows, the angular distribution of the stamped-out portions 28, the radial cutouts 21 and the bearing regions 22 over the periphery 19 of the pressure disc member 1 is such that, when the holding tongue portions 6 are pased through the cutouts 21, the portions 28 come to lie on actuating tongue portions 5b, as shown in the bottom left quadrant in Fig. 1, and, after the rotary movement of the diaphragm spring 4 relative to the pressure disc member 1, which is carried out for producing the bayonet-like connection, the stamped-out portions 28 project into slots 30 and the holding tongue portions 6 bear against the bearing regions 22 of the pressure disc member 1, as shown in the upper half of Fig. 1.

During the relative rotary movement as between the diaphragm spring 4 and the pressure disc member 1, the actuating tongue portions 5b which bear against the stud-like portions 28 and th holding tongue portions 6 which run on to th ramps 27 are resiliently d flect d in opposite directions while, after the rotary movement has taken place, the holding tongue portions 6 and the actuating tongue portions 5b spring axially back towards each other by the portions 28 snapping into the slots 30, so that the pressure disc member is mounted in a non-rotatable and centred condition relative to the diaphragm

spring 4, by virtue of the portions 28, and in addition is axially gripped between the actuating tongue portions 5 and 5b on the one hand and the holding tongue portions 6 on the other hand. In order to reduce the axial gripping of the pressure disc member or the force required for rotating the pressure disc member relative to the diaphragm spring, the holding tongue portions 6 are more resilient in the axial direction than the actuating tongue portions 5. For that purpose, the holding tongue portions 6 are narrower, as considered in the peripheral direction of the diaphragm spring. In the embodiment illustrated, the actuating tongue portions which, during the rotary movement of the pressure disc member 1 relative to the diaphragm spring 4, bear against the stud-like or pimple-like portions 28, are also narrower, as considered in the circumferential direction of the diaphragm spring over their radial portion 34, than the other actuating tongue portions 5.

In order to increase their axial resiliency, instead of being narrower in the circumferential direction, the holding tongue portions 6 and the actuating tongue portions 5b may also be thinner in regard to thickness of the material used.

CLAIMS

1. A friction clutch, in particular for motor vehicles, comprising a diaphragm spring which on the one hand is supported on a component such as a casing and which on the other hand engages a pressure plate and which also has at least substantially radially inwardly extending tongue portions, wherein a pressure disc member which serves for disengagement of the clutch can be secured by way of a bayonet-like connection in the radially inward region of the tongue portions and in that arrangement the pressure disc member is gripped in the axial direction between a larger number of actuating tongue portions provided on the side of the pressure disc member that is in the direction of disengagement of the friction clutch and a relatively smaller number of holding tongue portions which are disposed on the side remote from the direction of disengagement of the friction clutch and which are bent out in the axial direction with respect to the level in which the actuating tongue portions extend, characterised in that at its outside periphery (19) the pressure disc member (1) has radial cutouts (21) through which the holding tongue porti ns (6) can be passed and bearing regions (22, 23) which are form d thereon, for th holding and actuating tongue portions (6 and 5 respectively) and which are provided at least approximately on the same diameter (24) and which are of a spherical configuration in opposite directions, wherein the axial spacing between the respective contact locations for the actuating and holding tongue portions (5 and 6) on the spherical bearing regions (22, 23) is greater than the axial displacement (26) between the contact regions (5a, 6a) of the actuating tongue portions (5, 5b) and the holding tongue portions (6), which come to bear against the bearing regions (22, 23), in the non-assembled condition of the pressure disc member.

2. A friction clutch according to claim 1 characterised in that, as considered in the circumferential direction, between the bearing regions (22) for the holding tongue portions (6) and the radial cutouts (21), the pressure disc member (1) is provided with a respective run-on ramp (27) for the holding tongue portions (6), which is also of a spherical configuration in the same direction as the bearing regions (22) for the holding tongue portions (6).

3. A friction clutch according to one of claims 1 or 2 characterised in that the pressure disc member (1) is a shaped sheet metal member and the bearing regions for the actuating tongue portions (5, 5b) and the holding tongue portions (6) are formed by spherical stamped portions formed thereon, which face in opposite directons.

4. A friction clutch according to one of claims 1 to 3 charactierised in that the pressure disc member (1) has axial projections (28) with which it engages into slots (30) between the actuating tongue portions (5, 5b), to provide a non-rotatable connection.

5. A friction clutch according to claim 4 characterised in that the projections are formed by stud- or pimple-like stamped-out portions (28).

6. A friction clutch according to one of claims 4 or 5 characterised in that the axial projections (28) extend radially over the diametral region (28) of the bearing regions (22, 23) for the actuating and holding tongue portions (5, 5b; 6).

7. A friction clutch according to one of claims 1 to 6 characterised in that there are the same number of stamped-out portions (28) and bearing regions (22) for the holding tongue portions (6).

8. A friction clutch according to claim 7 characterised in that the pressure disc member has three stamped-out portions (28) and three bearing regions (22) for the holding tongue portions, which are respectively uniformly distributed over the periphery (19).

9. A friction clutch according to one of claims 1 to 8 characterised in that the radial cutouts (21) for th holding t ngue portions (6) are respectively conn cted to a cut-fr e portion (31) which extends in the circumferential direction and which at least partially undercuts the run-on ramp (27).

10. A friction clutch according to at least one of claims 1 to 9 characterised in that, as considered in th circumferential direction, disposed on the side of th b aring regions

(22) for th holding tongue portions (6), that is remot from the r sp ctive run-on ramp (27), is a notch (33) which extends radially over the diametral region (29) of the bearing regions (22, 23) for the actuating and holding tongue portions.

11. A friction clutch according to one of claims 1 to 10 characterised in that the radial cutouts (21), the cut-free portions (31) and the notches (33) are so arranged and dimensioned that the respective run-on ramps (27) with the bearing regions (22) associated therewith, for the holding tongue portions, form L-shaped or flag-like regions.

12. A friction clutch according to one of claims 1 to 11 characterised in that, as considered in the circumferential direction the respective angle between the axial projections (28) and the radial cutouts (21) of the pressure disc member (1) is such that, when the holding tongue portions (6) of the diaphragm spring (4) are passed through the cutouts (21) of the pressure disc member (1) the axial projections (28) come to lie on actuating tongue portions (5b) and in addition the angular spacing between the bearing regions (22) for the holding tongue portions (6) and the projections (28) is such that, after the rotary movement of the diaphragm spring (4) relative to the pressure disc member (1), which is performed for making the bayonet-like connection, the holding tongue portions (6) come to lie on the bearing regions (22) thereof and the axial projections (28) engage into slots (30) between the actuating tongue portions (5, 5b).

13. A friction clutch according to claim 12 characterised in that during the relative rotary movement the actuating tongue portions (5b) which co-operate with the axial projections (28) and the holding tongue portions (6) which run on to the run-on ramps (27) are resiliently deflected in opposite directions and after relative rotary movement spring back towards each other by the axial projections (28) snapping into slots (30) in the diaphragm spring, so that the pressure disc member (1) is axially gripped between the actuating tongue portions (5, 5b) and the holding tongue portions (6).

14. A friction clutch according to at least one of claims 1 to 13 characterised in that the holding tongue portions (6) which run on to the ramps (27) are more resilient in the axial direction than the other tongue portions.

15. A friction clutch according to at least one of claims 1 to 14 characterised in that the tongue portions (5b) which co-operate with the axial proj ctions (28) are more resilient in the axial direction than the oth r tongue porti ns (5) which bear on the same side of the pressure disc member.

16. A friction clutch according to at least on of claims 1 to 15 characterised in that, as viewed in the circumferential direction, the holding tongue portions (6) are narrower, at least over portions of their radial extent between their bearing region (6a) on the pressure disc memb r (1) and their radial outward end, than the other tongue portions (5, 5b).

17. A friction clutch according to at least one of claims 1 to 16 characterised in that, in order to increase their axial resiliency, the holding tongue portions (6) are thinner than the actuating tongue portions (5, 5b).

18. A friction clutch characterised in that a pressure disc member (1) in accordance with at least one of the preceding claims can be secured to the radially inward regions (5a, 6a) of a diaphragm spring (4) which bears with radially outward regions (7) against a clutch carrier plate (9) which can be secured to the crankshaft (17) of an internal combustion engine and which at a radially further inward position urges an axially movable pressure plate (11) towards a clutch disc (14) which is to be provided between the pressure plate (11) and a counterpressure plate (15) which can be axially and non-rotatably secured to the clutch carrier plate (9).

19. A friction clutch substantially as hereinbefore described with reference to the accompanying drawings.

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